



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/872,151	05/31/2001	Kyle M. Hanson	291958158US	9156
25096	7590	11/21/2005	EXAMINER	
PERKINS COIE LLP			WILKINS III, HARRY D	
PATENT-SEA			ART UNIT	
P.O. BOX 1247			PAPER NUMBER	
SEATTLE, WA 98111-1247			1742	

DATE MAILED: 11/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/872,151

**Applicant(s)**

HANSON ET AL.

**Examiner**

Harry D. Wilkins, III

**Art Unit**

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 2-16, 22-51, 54-56, 65-69, 75-86, 91 and 92 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-16, 22-51, 54-56, 65-69, 75-86, 91 and 92 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☒ Interview Summary (PTO-413)  
Paper No(s)/Mail Date 9/13/05
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Priority***

1. Applicant's addition of a priority claim to 10/158,220 and 60/294,690 is noted. However, the time period for making such additions has elapsed. Applicant is required to comply with the provisions of 37 CFR 1.78 in order for this priority claim to be considered valid. See MPEP 201.11.V. As such, this claim for priority has **not** been granted.

### ***Rejection Status***

2. The rejections under 35 USC 102 based on Woodruff et al (US 2001/0032788) (later filing date), Wilson et al (US 2002/0008037 and 6,660,137) (no disclosure of the interface member), Wilson et al (US 2002/0125141) (no disclosure of the interface member) and Chen et al (US 6,565,729) (no disclosure of the interface member).

### ***Allowable Subject Matter***

3. The indicated allowability (over Wang) of claims 2-14, 16, 22-31, 33-44, 46-41, 55, 56, 68-67, 69, 75-82, 84-86 and 91 is withdrawn in view of the newly revised interpretation of the claimed "interface member" with regard to Wang. Rejections based on the newly interpreted claim follow.

4. Claims 15, 32, 45, 54, 68, 83 and 92 are not rejected over the Wang reference because Wang expressly teaches that the diffuser ring permits fluid to flow through. Thus, Wang teaches away from the interface member being impermeable.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 2-16, 22-51, 54-56, 65-69, 75-86, 91 and 92 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Wilson et al (US 2003/0038035).

The applied reference has a common inventor and assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

The effective filing date of this reference is 30 May 2001. The effective filing date of the present application is 31 May 2001.

7. Claims 5-7, 12-14, 16, 47, 48-51, 55, 56 and 91 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang (US 6,391,166).

Wang anticipates the invention as claimed. Wang teaches (see figures 3A and 3B) a reactor apparatus for electrochemical processing of microelectronic workpieces

Art Unit: 1742

including a reaction vessel, a first outlet (23) configured to introduce a primary flow into the reaction vessel, second and third outlets (22 and 21) configured to introduce secondary flows into the reaction vessel separate from the primary flow, and "a field shaping unit" in the reaction vessel, including cylindrical walls (101, 103, 105, 107 and 109), that receives the secondary flows and is configured to contain the secondary flow separate from the primary flow through a portion of the reaction vessel and having at least one electrode compartment containing an electrode (2 or 3). The "field shaping unit" (i.e.-cylindrical walls) is made from insulating material, and thus, is dielectric (see col. 7, lines 36-50). Wang teaches (see figure 17 and col. 23, lines 10-20) including a diffuser ring (110, 112) carried by the cylindrical walls downstream for the electrode, the diffuser ring being in fluid communication with the second flow in the electrode compartment, wherein the interface member is configured to prevent selected particulate matter from passing between the secondary flow and the primary flow.

Regarding claims 5-7, 25, 26, see also figures 20A and 20B.

Regarding claim 13, the diffuser ring of Wang acts as a filter capable of removing particles from the secondary flow.

Regarding claim 14, the diffuser ring of Wang acts as an ion-membrane configured to allow selected ions to pass between the secondary and primary flows.

Regarding claim 16, the diffuser ring of Wang acts as an ion-membrane configured to allow selected ions to pass between the secondary and primary flows. The diffuser ring of Wang is substantially permeable to fluid.

Regarding claim 47, the apparatus of Wang included a reaction vessel, a first fluid conduit for introducing a primary flow (central cavity) and a second fluid conduit (outer cavities), an interface member as claimed (diffuser ring) and at least one electrode in an electrode compartment upstream of the interface member.

Regarding claim 91, the diffuser ring of Wang constitutes an ion-exchange membrane to allow selected ions to pass through.

Regarding claim 48, the apparatus of Wang includes a plurality of compartments as claimed and a plurality of separate electrodes as claimed. The diffuser ring is considered to be an ion-membrane as it is configured to allow selected ions across.

Regarding claim 49, the apparatus of Wang includes a diffuser ring above each electrode.

Regarding claims 50 and 51, the apparatus of Wang includes first and second annular walls inside the container creating first and second annular spaces which are first and second electrode compartments in which annular electrodes are placed.

Regarding claim 55, the diffuser ring of Wang is permeable to fluid.

Regarding claim 56, the annular walls of Wang constitute a "dielectric field shaping unit" as claimed.

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang (US 6,391,166) in view of Weaver et al (US 6,471,913).

The teachings of Wang are described above.

However, Wang is silent with respect to the apparatus including a primary flow guide as claimed.

Weaver et al teach (see figure 1B and col. 5, line 50 to col. 6, line 37) a primary flow guide as claimed which provides an electrolyte flow in a microelectronic workpiece apparatus that produces a substantially radially independent normal component of flow thereby resulting in uniform flow producing uniform mass flux at the wafer surface.

Therefore, it would have been obvious to one of ordinary skill in the art to have added in the primary flow outlet, a primary flow guide as taught by Weaver et al because Weaver et al teach that it produces uniform electrolyte flow at the surface of the microelectronic wafer.

10. Claims 8-11, 22, 25-31, 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang (US 6,391,166) in view of Woodruff et al (US 2001/0032788).

The teachings of Wang are described above.

However, Wang is silent with respect to the apparatus including a virtual electrode unit as claimed.

Woodruff et al teach (see figure 6 and paragraphs 77 and 80) a virtual electrode as claimed which provides benefits by isolating the anodes from a primary electrolyte flow in a microelectronic workpiece apparatus.

Therefore, it would have been obvious to one of ordinary skill in the art to have added a virtual electrode unit as claimed as taught by Woodruff et al because Woodruff et al teach that it provides controlled application of electric field at the surface of the microelectronic wafer.

Regarding claims 9-11, 22, 27-29, Woodruff et al teach a distributor as claimed (see figures 7A-7D). Therefore, it would have been obvious to one of ordinary skill in the art to have used a distributor as taught by Woodruff et al because the distributor provides easy distribution of electrolyte to multiple flow inlets.

Regarding claims 25 and 26, see above regarding claims 5 and 7.

Regarding claims 30, 31 and 33, see above regarding claims 13, 14 and 16.

11. Claims 23, 24, 34-44 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang (US 6,391,166) in view of Woodruff et al (US 2001/0032788) as applied above to claim 22 and further in view of Weaver et al (US 6,471,913).

The teachings of Wang, Woodruff et al and Weaver et al are described above.

Wang and Woodruff et al do not teach the primary flow guide as claimed.

However, Weaver et al teach (see figure 1B and col. 5, line 50 to col. 6, line 37) a primary flow guide as claimed which provides an electrolyte flow in a microelectronic workpiece apparatus that produces a substantially radially independent normal component of flow thereby resulting in uniform flow producing uniform mass flux at the wafer surface.

Therefore, it would have been obvious to one of ordinary skill in the art to have added in the primary flow outlet, a primary flow guide as taught by Weaver et al



Art Unit: 1742

because Weaver et al teach that it produces uniform electrolyte flow at the surface of the microelectronic wafer.

12. Claims 65-67, 69 and 86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang (US 6,391,166) in view of Harada et al (US 5,700,127).

The teachings of Wang are described above.

Wang does not teach a head assembly as claimed.

Harada et al teach (see figure 1) an apparatus for treating semiconductor wafers that includes a cabinet, a head assembly for holding the wafers and a transfer device for handling the wafers.

Therefore, it would have been obvious to one of ordinary skill in the art to have used a conventional head assembly as taught by Harada et al because the head assembly provides easy multi-step processing of the microelectronic wafer.

Regarding claim 86, Wang teaches the processing chamber, first and second fluid conduits, interface member and electrodes as claimed. Harada et al teach the head assembly as claimed.

13. Claims 75, 78-82 and 84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang (US 6,391,166) in view of Woodruff et al (US 2001/0032788) as applied above to claim 9, and further in view of Harada et al (US 5,700,127).

The teachings of Wang and Woodruff et al are described above.

Wang and Woodruff et al do not teach a head assembly as claimed.

Harada et al teach (see figure 1) an apparatus for treating semiconductor wafers that includes a cabinet, a head assembly for holding the wafers and a transfer device for handling the wafers.

Therefore, it would have been obvious to one of ordinary skill in the art to have used a conventional head assembly as taught by Harada et al because the head assembly provides easy multi-step processing of the microelectronic wafer.

Regarding claims 78 and 79, see above regarding claims 5 and 7

14. Claims 76, 77 and 85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang (US 6,391,166) in view of Woodruff et al (US 2001/0032788) and Harada et al (US 5,700,127) as applied above to claim 75, and further in view of Weaver et al (US 6,471,913).

The teachings of Wang, Woodruff et al and Harada et al are described above.

Wang, Woodruff et al and Harada et al fail to teach a primary flow guide as claimed.

Weaver et al teach (see figure 1B and col. 5, line 50 to col. 6, line 37) a primary flow guide as claimed which provides an electrolyte flow in a microelectronic workpiece apparatus that produces a substantially radially independent normal component of flow thereby resulting in uniform flow producing uniform mass flux at the wafer surface.

Therefore, it would have been obvious to one of ordinary skill in the art to have added in the primary flow outlet, a primary flow guide as taught by Weaver et al because Weaver et al teach that it produces uniform electrolyte flow at the surface of the microelectronic wafer.

***Response to Arguments***

15. Applicant's arguments filed 11 October 2005 have been fully considered but they are not persuasive. Applicant's arguments are found persuasive with respect to all of the rejection grounds with the exception of Wilson et al (US 2003/0038035). Applicant's response added a priority claim to the present application claiming priority to the application upon which the Wilson et al publication is based. However, since the time period for making priority claims has elapsed, the priority claim has not been entered. Applicant's attention is directed to MPEP 201.11.V. for more information regarding how to add the priority claim after the time period for making the priority claim has elapsed.

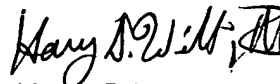
***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D. Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1742

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Harry D Wilkins, III  
Examiner  
Art Unit 1742

hdw